WHAT IS CLAIMED IS:

1. A Fischer-Tropsch catalyst for the conversion of synthesis gas into Fischer-Tropsch products, the catalyst comprising:

a structured catalyst support;

an active metal for promoting a Fischer-Tropsch reaction disposed on the catalyst support; and

wherein the support has a voidage ratio greater than 0.6 and at least one linear dimension greater than 100 microns.

2. The catalyst of Claim 1 wherein the catalyst support has a linear dimension of at least 200 microns.

3. The catalyst of Claim 1 wherein the catalyst support has a linear dimension of at least 500 microns.

4. The catalyst of Claim 1 wherein the catalyst support has a linear dimension of at least 700 microns.

5. The catalyst of Claim 1 wherein the catalyst support has a linear dimension of at least one inch.

6. The catalyst of Claim 1 wherein the Fischer-Tropsch catalyst has a catalyst concentration for a given volume of at least 10 percent.

7. The catalyst of Claim 1 wherein the catalyst support is formed with a mean L/D less than 20.

8. The catalyst of Claim 1 wherein the catalyst is operable to produce a productivity in the range of 200 – 4000 vol CO/vol. catalyst/hour or greater over at least a 600 hour run of a Fischer-Tropsch reactor with the catalyst therein.

9. A Fischer-Tropsch catalyst system for the conversion of synthesis gas into Fischer-Tropsch products, the catalyst system comprising a structured Fischer-Tropsch catalyst with a voidage ratio greater than or equal to 0.45 and a catalyst concentration for a given volume of at least 10 percent.

10. A method of preparing a Fischer-Tropsch catalyst for use in converting synthesis gas into Fischer-Tropsch products, the method comprising the steps of:

providing a structured catalyst support having a voidage ratio greater than 0.6; and

applying an active metal for promoting a Fischer-Tropsch reaction to the catalyst support.

11. The method of Claim 10 wherein the step of providing a catalyst support comprises providing a catalyst support having a mean L/D ratio of less than 10.

12. The method of Claim 10 wherein the step of providing a catalyst support comprises providing a catalyst support having at least one linear dimension greater than 200 microns.

13. The method of Claim 10 wherein the step of providing a catalyst support comprises providing a catalyst support having at least one linear dimension greater than 500 microns.

14. The method of Claim 10 wherein the step of providing a catalyst support comprises providing a catalyst support having at least one linear dimension greater than 700 microns.

15. The method of Claim 10 wherein the step of providing a catalyst support comprises providing a catalyst support having at least one linear dimension greater than one inch.

16. A system for converting CO and H_2 into Fischer-Tropsch products through the Fischer-Tropsch reaction, the system comprising:

an inlet;

a reactor fluidly coupled to the inlet for receiving CO and H_2;

a stationary, structured Fischer-Tropsch catalyst disposed within the reactor for converting at least a portion of the CO and H_2 into Fischer-Tropsch products through Fischer-Tropsch reaction; and

wherein the structured catalyst has a voidage ratio greater than or equal to 0.6.

17. The system of Claim 16 wherein the structured Fischer-Tropsch catalyst disposed within the reactor has at least a catalyst concentration of 30 percent.

18. The system of Claim 16 wherein the structured Fischer-Tropsch catalyst has a linear dimension of at least 500 microns.

19. A system for converting shorter-chain hydrocarbons into longer-chain hydrocarbons, the system comprising:

a feed stream preparation subsystem for receiving an oxygen-containing gas, light hydrocarbons, water, and tail gas, and preparing the feed streams for conversion to synthesis gas;

a synthesis-gas subsystem for receiving feed streams of oxygen-containing gas, light hydrocarbons, and steam and preparing therefrom synthesis gas;

a synthesis subsystem for receiving synthesis gas from the synthesis-gas subsystem and for converting at least a substantial portion of the synthesis gas into longer-chain hydrocarbons through the Fischer-Tropsch reaction; and wherein the synthesis subsystem comprises:

a saturator unit having an inlet for receiving a circulating hydrocarbon liquid and an inlet for receiving synthesis gas, the saturator for substantially saturating a hydrocarbon liquid with synthesis gas introduced into the saturator;

a reactor fluidly coupled to the saturator unit for receiving a saturated hydrocarbon liquid therefrom; and

a stationary, structured Fischer-Tropsch catalyst disposed within the reactor for converting at least a portion of a saturated hydrocarbon liquid into longer-chain hydrocarbons.

20. A system for converting synthesis gas into longer-chain hydrocarbon products through the Fisher-Tropsch reaction, the system comprising:

a saturator unit having an inlet for receiving a circulating hydrocarbon liquid and an inlet for receiving synthesis gas, the saturator for substantially saturating a hydrocarbon liquid with synthesis gas introduced into the saturator;

a reactor fluidly coupled to the saturator unit for receiving a saturated hydrocarbon liquid therefrom; and

a stationary, structured Fischer Tropsch catalyst disposed within the reactor for converting at least a portion of a saturated hydrocarbon liquid into longer-chain hydrocarbons through a Fischer-Tropsch reaction.

21. The system of Claim 20 further comprising a heat exchanger associated with the reactor for removing heat from the reactor.

22. Method for converting synthesis gas into Fischer-Tropsch products through the Fischer-Tropsch reaction, the method comprising the steps of:

delivering CO and H_2 to a reactor having a stationary, structured Fischer-Tropsch catalyst disposed in the reactor; wherein the structured Fischer-Tropsch catalyst includes at least one structure having a linear dimension exceeding 20 millimeters, a void ratio exceeding 0.6, and a contour that causes a non-Taylor flow when the CO and H_2 pass through the structure; and

causing the CO and H_2 to flow through the reactor whereby the stationary, structured Fischer-Tropsch catalyst converts at least a portion of the CO and H_2 into Fischer-Tropsch products.

23. The method of Claim 22 wherein the step of delivering CO and H_2 to the reactor comprises the steps of: saturating a hydrocarbon liquid with synthesis gas and delivering the saturated hydrocarbon liquid to the reactor;

the step of causing the CO and H_2 to flow through the reactor comprises causing the saturated hydrocarbon liquid to flow through the structured Fischer-Tropsch catalyst; and

the method further comprises the step of removing reaction heat from the hydrocarbon liquid with a heat exchanger.

24. The method of Claim 22 wherein the step of delivering CO and H_2 to the reactor comprises the step of delivering synthesis gas to the reactor.

25. The method of Claim 22 wherein the step of delivering CO and H_2 to the reactor comprises the steps of: saturating a hydrocarbon liquid with synthesis gas, delivering the saturated hydrocarbon liquid to the reactor, and delivering synthesis gas to the reactor.

26. The method of Claim 22 wherein:

the step of delivering CO and H_2 to a reactor comprises delivering CO and H_2 to a reactor having a structured Fischer-Tropsch catalyst fixed in the reactor such that the structured Fischer-Tropsch catalyst remains substantially stationary when the CO and H_2 flows through the structured Fischer-Tropsch catalyst.

27. The method of Claim 26 wherein:

the structured Fischer-Tropsch catalyst comprises a structured Fischer-Tropsch catalyst having a linear dimension exceeding 20 millimeters; and

the step of causing the CO and H_2 to flow through the reactor comprises causing the CO and H_2 to flow through the Fischer-Tropsch catalyst.

28. The method of Claim 23 wherein:

the structured Fischer-Tropsch catalyst comprises a structured Fischer-Tropsch catalyst having a linear dimension of at least 20 millimeters; and

the step of causing the saturated hydrocarbon liquid to flow through the structured Fischer-Tropsch catalyst comprises:

causing the saturated hydrocarbon liquid to flow through the Fischer-Tropsch catalyst; and

holding the Fischer-Tropsch catalyst substantially stationary, while the saturated hydrocarbon liquid flows through the Fischer-Tropsch catalyst.